Gunter, Jason

From: Nations, Mark [mnations@doerun.com]
Sent: Monday, May 13, 2013 2:43 PM
To: Gunter, Jason
Cc: England, Jason; Yingling, Mark; Wohl, Matthew; robert.hinkson@dnr.mo.gov; Ty Morris (TMorris@barr.com)
Subject: April Monthly Progress Report
Attachments: LW 04-13.doc; Leadwood NPDES Samples_04-03-13.pdf

Jason,
Attached is the Leadwood Monthly Progress Report.
Mark

THE DOE RUN COMPANY

Remediation Group

Mark Nations
Mining Properties Manager
mnations@doerun.com

May 13, 2013

Mr. Jason Gunter
Remedial Project Manager
U.S. Environmental Protection Agency
Region 7 - Superfund Branch
11201 Renner Blvd.
Lenexa, KS 66219

Re: The Doe Run Company - Leadwood Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 50 of the Unilateral Administrative Order (Docket No. CERCLA-07-2006-0272) for the referenced project and on behalf of The Doe Run Company, the progress report for the period April 1, 2013 through April 30, 2013 is enclosed. If you have any questions or comments, please call me at 573-518-0800.

Sincerely,

Mark Nations
Mining Properties Manager

Enclosures
c: Jason England – TDRC
Mark Yingling – TDRC (electronic only)
Matt Wohl – TDRC (electronic only)
Robert Hinkson – MDNR
Ty Morris – Barr Engineering

Leadwood Mine Tailings Site
Leadwood, Missouri
Removal Action - Monthly Progress Report
Period: March 1, 2013 – March 31, 2013

1. **Actions Performed or Completed This Period:**
   a. No activities were completed at the site during this period.
2. **Data and Results Received This Period:**
   a. During this period, water samples were collected from downstream of Leadwood Dam and the East Seep and Erosion Area, as well as from upstream and downstream of the confluence of Eaton Creek with Big River. The analytical results for this event are included with this progress report.

   The December 2012 Ambient Air Monitoring Report noted the following: - During this period, the Ambient Air Monitoring Report for January 2013 was completed. Any issues identified in this reports are discussed below. A copy of this document has been sent to your attention.

   The January 2013 Ambient Air Monitoring Report noted the following:

   - The action levels for lead and dust were not exceeded.
   - No samples were taken with the TSP and PM10 monitors 01/01/13 due to the holiday.
   - The sample for Big River #4 (QA) TSP monitor on 01/24/13 was invalid due to a mechanical failure. Upon discovering the mechanical failure, the issue was addressed.
   - The sample for Leadwood #3 (School) TSP monitor on 01/30/13 was invalid due to a mechanical failure. Upon discovering the mechanical failure, the issue was addressed.
3. **Scheduled Activities not Completed This Period:**
   a. None.
4. **Planned Activities for Next Period:**
   a. Continue vegetation maintenance activities. The use of biosolids will only be continued if a biosolids management plan has been submitted to and approved by EPA.
   b. It is anticipated that EPA will use this site as a soil repository in the future. Preparations for these activities will continue.
   c. Complete monthly water sampling activities as described in the Removal Action Work Plan.
   d. Complete air monitoring activities as described in the Removal Action Work Plan.
5. **Changes in Personnel:**
   a. None.
6. **Issues or Problems Arising This Period:**
   a. None.
7. **Resolution of Issues or Problems Arising This Period:**
   a. None.

End of Monthly Progress Report

April 15, 2013

Allison Olds
Barr Engineering Company
1001 Diamond Ridge
Suite 1100
Jefferson City, MO 65109
TEL: (573) 638-5007
FAX: (573) 638-5001

RE: Leadwood Mine Tailings Site NPDES **WorkOrder:** 13040249

Dear Allison Olds:

TEKLAB, INC received 5 samples on 4/4/2013 8:00:00 AM for the analysis presented in the following report.

Samples are analyzed on an as received basis unless otherwise requested and documented. The sample results contained in this report relate only to the requested analytes of interest as directed on the chain of custody. NELAP accredited fields of testing are indicated by the letters NELAP under the Certification column. Unless otherwise documented within this report, Teklab Inc. analyzes samples utilizing the most current methods in compliance with 40CFR. All tests are performed in the Collinsville, IL laboratory unless otherwise noted in the Case Narrative.

All quality control criteria applicable to the test methods employed for this project have been satisfactorily met and are in accordance with NELAP except where noted. The following report shall not be reproduced, except in full, without the written approval of Teklab, Inc.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael L. Austin
Project Manager
(618)344-1004 ex 16
MAustin@teklabinc.com

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

This reporting package includes the following:

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

Abbr Definition

CCV	Continuing calibration verification is a check of a standard to determine the state of calibration of an instrument between recalibration.
DF	Dilution factor is the dilution performed during analysis only and does not take into account any dilutions made during sample preparation. The reported result is final and includes all dilutions factors.
DNI	Did not ignite
DUP	Laboratory duplicate is an aliquot of a sample taken from the same container under laboratory conditions for independent processing and analysis independently of the original aliquot.
ICV	Initial calibration verification is a check of a standard to determine the state of calibration of an instrument before sample analysis is initiated.
IDPH	IL Dept. of Public Health
LCS	Laboratory control sample, spiked with verified known amounts of analytes, is analyzed exactly like a sample to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system. The acceptable recovery range is in the QC Package (provided upon request).
LCSD	Laboratory control sample duplicate is a replicate laboratory control sample that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MB	Method blank is a sample of a matrix similar to the batch of associated sample (when available) that is free from the analytes of interest and is processed simultaneously with and under the same conditions as samples through all steps of the analytical procedures, and in which no target analytes or interferences should present at concentrations that impact the analytical results for sample analyses.
MDL	Method detection limit means the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix type containing the analyte.
MS	Matrix spike is an aliquot of matrix fortified (spiked) with known quantities of specific analytes that is subjected to the entire analytical procedures in order to determine the effect of the matrix on an approved test method's recovery system. The acceptable recovery range is listed in the QC Package (provided upon request).
MSD	Matrix spike duplicate means a replicate matrix spike that is prepared and analyzed in order to determine the precision of the approved test method. The acceptable recovery range is listed in the QC Package (provided upon request).
MW	Molecular weight
ND	Not Detected at the Reporting Limit
NELAP	NELAP Accredited
PQL	Practical quantitation limit means the lowest level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operation conditions. The acceptable recovery range is listed in the QC Package (provided upon request).
RL	The reporting limit the lowest level that the data is displayed in the final report. The reporting limit may vary according to customer request or sample dilution. The reporting limit may not be less than the MDL.
RPD	Relative percent difference is a calculated difference between two recoveries (ie. MS/MSD). The acceptable recovery limit is listed in the QC Package (provided upon request).
SPK	The spike is a known mass of target analyte added to a blank sample or sub-sample; used to determine recovery deficiency or for other quality control purposes.
Surr	Surrogates are compounds which are similar to the analytes of interest in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples.
TNTC	Too numerous to count (> 200 CFU)

Qualifiers

- # - Unknown hydrocarbon
- B - Analyte detected in associated Method Blank
- E - Value above quantitation range
- H - Holding times exceeded
- M - Manual Integration used to determine area response
- ND - Not Detected at the Reporting Limit
- R - RPD outside accepted recovery limits
- S - Spike Recovery outside recovery limits
- X - Value exceeds Maximum Contaminant Level

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

Cooler Receipt Temp: 1.8 °C

Locations and Accreditations

Collinsville		Springfield		Kansas City	
Address	5445 Horseshoe Lake Road Collinsville, IL 62234-7425	Address	3920 Pintail Dr Springfield, IL 62711-9415	Address	8421 Nieman Road Lenexa, KS 66214
Phone	(618) 344-1004	Phone	(217) 698-1004	Phone	(913) 541-1998
Fax	(618) 344-1005	Fax	(217) 698-1005	Fax	(913) 541-1998
Email	jhriley@teklabinc.com	Email	KKlostermann@teklabinc.com	Email	dthompson@teklabinc.com

State	Dept	Cert #	NELAP	Exp Date	Lab
Illinois	IEPA	100226	NELAP	1/31/2014	Collinsville
Kansas	KDHE	E-10374	NELAP	1/31/2014	Collinsville
Louisiana	LDEQ	166493	NELAP	6/30/2013	Collinsville
Louisiana	LDEQ	166578	NELAP	6/30/2013	Springfield
Texas	TCEQ	T104704515-12-1	NELAP	7/31/2013	Collinsville
Arkansas	ADEQ	88-0966		3/14/2014	Collinsville
Illinois	IDPH	17584		4/30/2013	Collinsville
Kentucky	UST	0073		4/5/2014	Collinsville
Missouri	MDNR	00930		4/13/2013	Collinsville
Oklahoma	ODEQ	9978		8/31/2013	Collinsville

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13
Lab ID: 13040249-001
Client Sample ID: LW-001
Matrix: SURFACE WATER
Collection Date: 04/03/2013 7:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	100		**238**	mg/L	10	04/04/2013 14:47	R175513
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.85**		1	04/08/2013 17:00	R175654
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	04/04/2013 14:06	R175517
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		**< 0.1**	ml/L	1	04/04/2013 11:35	R175507
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**2.4**	mg/L	1	04/04/2013 20:00	R175536
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**2.60**	µg/L	1	04/05/2013 4:51	87071
Zinc	NELAP	10.0		**2210**	µg/L	1	04/05/2013 4:51	87071
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**2.90**	µg/L	1	04/05/2013 18:44	87095
Zinc	NELAP	10.0		**2680**	µg/L	1	04/05/2013 18:44	87095
MS QC limits for Ca and Mg are not applicable due to high sample/spike ratio.								
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	**7.57**	µg/L	1	04/10/2013 10:53	87148
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO3)	NELAP	1.00		**430**	mg/L	1	04/05/2013 0:00	R175577
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	**6.21**	µg/L	1	04/10/2013 12:05	87235

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13
Lab ID: 13040249-002
Client Sample ID: LW-002
Matrix: SURFACE WATER
Collection Date: 04/03/2013 8:45

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	200		**461**	mg/L	20	04/04/2013 14:52	R175513
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.96**		1	04/08/2013 17:00	R175654
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	04/04/2013 14:06	R175517
STANDARD METHODS 2540 F								
Solids, Settleable	NELAP	0.1		**< 0.1**	ml/L	1	04/04/2013 11:35	R175507
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**2.1**	mg/L	1	04/04/2013 18:12	R175536
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**2.40**	µg/L	1	04/05/2013 5:09	87071
Zinc	NELAP	10.0		**3700**	µg/L	1	04/05/2013 5:09	87071
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**3.40**	µg/L	1	04/05/2013 19:02	87095
Zinc	NELAP	10.0		**3920**	µg/L	1	04/05/2013 19:02	87095
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00	X	**10.1**	µg/L	1	04/10/2013 10:56	87148
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO3)	NELAP	1.00		**635**	mg/L	1	04/05/2013 0:00	R175577
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00	X	**7.36**	µg/L	1	04/10/2013 12:08	87235

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13
Lab ID: 13040249-003
Client Sample ID: LW-US
Matrix: SURFACE WATER
Collection Date: 04/03/2013 7:15

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**17**	mg/L	1	04/04/2013 15:33	R175513
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.96**		1	04/08/2013 17:00	R175654
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	04/04/2013 14:13	R175517
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**1.5**	mg/L	1	04/04/2013 18:18	R175536
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 5:15	87071
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	04/05/2013 5:15	87071
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 19:08	87095
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	04/05/2013 19:08	87095
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 11:16	87148
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO3)	NELAP	1.00		**148**	mg/L	1	04/05/2013 0:00	R175577
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 12:18	87235

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13
Lab ID: 13040249-004
Client Sample ID: LW-DS
Matrix: SURFACE WATER
Collection Date: 04/03/2013 9:25

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10	S	**21**	mg/L	1	04/04/2013 15:38	R175513
MS and/or MSD did not recover within control limits due to matrix interference.								
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**8.08**		1	04/08/2013 17:00	R175654
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	04/04/2013 14:13	R175517
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**1.5**	mg/L	1	04/04/2013 18:24	R175536
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 5:21	87071
Zinc	NELAP	10.0		**25.3**	µg/L	1	04/05/2013 5:21	87071
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 19:14	87095
Zinc	NELAP	10.0		**27.3**	µg/L	1	04/05/2013 19:14	87095
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 11:20	87148
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO3)	NELAP	1.00		**154**	mg/L	1	04/05/2013 0:00	R175577
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 12:21	87235

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13
Lab ID: 13040249-005
Client Sample ID: LW-DUP
Matrix: SURFACE WATER
Collection Date: 04/03/2013 0:00

Analyses	Certification	RL	Qual	Result	Units	DF	Date Analyzed	Batch
EPA 600 375.2 REV 2.0 1993 (TOTAL)								
Sulfate	NELAP	10		**17**	mg/L	1	04/05/2013 18:15	R175597
STANDARD METHOD 4500-H B, LABORATORY ANALYZED								
Lab pH	NELAP	1.00		**7.91**		1	04/05/2013 21:29	R175587
STANDARD METHODS 2540 D								
Total Suspended Solids	NELAP	6		**< 6**	mg/L	1	04/04/2013 14:13	R175517
STANDARD METHODS 5310 C, ORGANIC CARBON								
Total Organic Carbon (TOC)	NELAP	1.0		**1.4**	mg/L	1	04/04/2013 18:31	R175536
EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 5:27	87071
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	04/05/2013 5:27	87071
EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)								
Cadmium	NELAP	2.00		**< 2.00**	µg/L	1	04/05/2013 19:20	87095
Zinc	NELAP	10.0		**< 10.0**	µg/L	1	04/05/2013 19:20	87095
STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 11:23	87148
STANDARD METHODS 2340 B, HARDNESS (TOTAL)								
Hardness, as (CaCO3)	NELAP	1.00		**144**	mg/L	1	04/05/2013 0:00	R175577
STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)								
Lead	NELAP	2.00		**< 2.00**	µg/L	1	04/10/2013 12:25	87235

Sample Summary

Client: Barr Engineering Company
Client Project: Leadwood Mine Tailings Site NPDES

Work Order: 13040249
Report Date: 15-Apr-13

Lab Sample ID	Client Sample ID	Matrix	Fractions	Collection Date
13040249-001	LW-001	Surface Water	5	04/03/2013 7:45
13040249-002	LW-002	Surface Water	5	04/03/2013 8:45
13040249-003	LW-US	Surface Water	5	04/03/2013 7:15
13040249-004	LW-DS	Surface Water	5	04/03/2013 9:25
13040249-005	LW-DUP	Surface Water	5	04/03/2013 0:00

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			Prep Date/Time	Analysis Date/Time
13040249-001A	LW-001	04/03/2013 7:45	04/04/2013 8:00		
	Standard Methods 2540 F				04/04/2013 11:35
13040249-001B	LW-001	04/03/2013 7:45	04/04/2013 8:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				04/04/2013 14:47
	Standard Method 4500-H B, Laboratory Analyzed				04/08/2013 17:00
	Standard Methods 2540 D				04/04/2013 14:06
13040249-001C	LW-001	04/03/2013 7:45	04/04/2013 8:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			04/04/2013 19:08	04/05/2013 18:44
	Standard Methods 3030 E, 3113 B, Metals by GFAA			04/05/2013 18:02	04/10/2013 10:53
	Standard Methods 2340 B, Hardness (Total)				04/05/2013 0:00
13040249-001D	LW-001	04/03/2013 7:45	04/04/2013 8:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			04/04/2013 12:19	04/05/2013 4:51
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			04/08/2013 22:45	04/10/2013 12:05
13040249-001E	LW-001	04/03/2013 7:45	04/04/2013 8:00		
	Standard Methods 5310 C, Organic Carbon				04/04/2013 20:00
13040249-002A	LW-002	04/03/2013 8:45	04/04/2013 8:00		
	Standard Methods 2540 F				04/04/2013 11:35
13040249-002B	LW-002	04/03/2013 8:45	04/04/2013 8:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				04/04/2013 14:52
	Standard Method 4500-H B, Laboratory Analyzed				04/08/2013 17:00
	Standard Methods 2540 D				04/04/2013 14:06
13040249-002C	LW-002	04/03/2013 8:45	04/04/2013 8:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			04/04/2013 19:08	04/05/2013 19:02
	Standard Methods 3030 E, 3113 B, Metals by GFAA			04/05/2013 18:02	04/10/2013 10:56
	Standard Methods 2340 B, Hardness (Total)				04/05/2013 0:00
13040249-002D	LW-002	04/03/2013 8:45	04/04/2013 8:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			04/04/2013 12:19	04/05/2013 5:09
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			04/08/2013 22:45	04/10/2013 12:08
13040249-002E	LW-002	04/03/2013 8:45	04/04/2013 8:00		
	Standard Methods 5310 C, Organic Carbon				04/04/2013 18:12
13040249-003A	LW-US	04/03/2013 7:15	04/04/2013 8:00		
	Standard Methods 2540 D				04/04/2013 14:13
13040249-003B	LW-US	04/03/2013 7:15	04/04/2013 8:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				04/04/2013 15:33
	Standard Method 4500-H B, Laboratory Analyzed				04/08/2013 17:00
13040249-003C	LW-US	04/03/2013 7:15	04/04/2013 8:00		

Client: Barr Engineering Company
Client Project: Leadwood Mine Tailings Site NPDES

Work Order: 13040249
Report Date: 15-Apr-13

Sample ID	Client Sample ID	Collection Date	Received Date		
	Test Name			**Prep Date/Time**	**Analysis Date/Time**
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			04/04/2013 19:08	04/05/2013 19:08
	Standard Methods 3030 E, 3113 B, Metals by GFAA			04/05/2013 18:02	04/10/2013 11:16
	Standard Methods 2340 B, Hardness (Total)				04/05/2013 0:00
13040249-003D	LW-US	04/03/2013 7:15	04/04/2013 8:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			04/04/2013 12:19	04/05/2013 5:15
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			04/08/2013 22:45	04/10/2013 12:18
13040249-003E	LW-US	04/03/2013 7:15	04/04/2013 8:00		
	Standard Methods 5310 C, Organic Carbon				04/04/2013 18:18
13040249-004A	LW-DS	04/03/2013 9:25	04/04/2013 8:00		
	Standard Methods 2540 D				04/04/2013 14:13
13040249-004B	LW-DS	04/03/2013 9:25	04/04/2013 8:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				04/04/2013 15:38
	Standard Method 4500-H B, Laboratory Analyzed				04/08/2013 17:00
13040249-004C	LW-DS	04/03/2013 9:25	04/04/2013 8:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			04/04/2013 19:08	04/05/2013 19:14
	Standard Methods 3030 E, 3113 B, Metals by GFAA			04/05/2013 18:02	04/10/2013 11:20
	Standard Methods 2340 B, Hardness (Total)				04/05/2013 0:00
13040249-004D	LW-DS	04/03/2013 9:25	04/04/2013 8:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			04/04/2013 12:19	04/05/2013 5:21
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			04/08/2013 22:45	04/10/2013 12:21
13040249-004E	LW-DS	04/03/2013 9:25	04/04/2013 8:00		
	Standard Methods 5310 C, Organic Carbon				04/04/2013 18:24
13040249-005A	LW-DUP	04/03/2013 0:00	04/04/2013 8:00		
	Standard Methods 2540 D				04/04/2013 14:13
13040249-005B	LW-DUP	04/03/2013 0:00	04/04/2013 8:00		
	EPA 600 375.2 Rev 2.0 1993 (Total)				04/05/2013 18:15
	Standard Method 4500-H B, Laboratory Analyzed				04/05/2013 21:29
13040249-005C	LW-DUP	04/03/2013 0:00	04/04/2013 8:00		
	EPA 600 4.1.4, 200.7R4.4, Metals by ICP (Total)			04/04/2013 19:08	04/05/2013 19:20
	Standard Methods 3030 E, 3113 B, Metals by GFAA			04/05/2013 18:02	04/10/2013 11:23
	Standard Methods 2340 B, Hardness (Total)				04/05/2013 0:00
13040249-005D	LW-DUP	04/03/2013 0:00	04/04/2013 8:00		
	EPA 600 4.1.1, 200.7R4.4, Metals by ICP (Dissolved)			04/04/2013 12:19	04/05/2013 5:27
	Standard Methods 3030 B, 3113 B, Metals by GFAA (Dissolved)			04/08/2013 22:45	04/10/2013 12:25
13040249-005E	LW-DUP	04/03/2013 0:00	04/04/2013 8:00		
	Standard Methods 5310 C, Organic Carbon				04/04/2013 18:31

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

EPA 600 375.2 REV 2.0 1993 (TOTAL)

Batch R175513 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						04/04/2013

Batch R175513 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**19**	20	0	93.2	90	110	04/04/2013

Batch R175513 **SampType:** MS Units **mg/L**
SampID: 13040249-004BMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10	S	**29**	10	21.03	75.4	90	110	04/04/2013

Batch R175513 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 13040249-004BMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Sulfate	10	S	**27**	10	21.03	60.5	28.57	5.35	04/04/2013

Batch R175597 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**< 10**						04/05/2013

Batch R175597 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Sulfate	10		**21**	20	0	104.6	90	110	04/05/2013

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R175587 **SampType:** LCS Units
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		**6.99**	7.00	0	99.9	99.1	100.8	04/05/2013

Batch R175587 **SampType:** DUP Units RPD Limit **10**
SampID: 13040249-005B

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.93**				7.910	0.25	04/05/2013

Client: Barr Engineering Company
Client Project: Leadwood Mine Tailings Site NPDES

Work Order: 13040249
Report Date: 15-Apr-13

STANDARD METHOD 4500-H B, LABORATORY ANALYZED

Batch R175654 **SampType:** LCS Units
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lab pH	1.00		**7.01**	7.00	0	100.1	99.1	100.8	04/08/2013

Batch R175654 **SampType:** DUP Units RPD Limit **10**
SampID: 13040249-001B

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.93**				7.850	1.01	04/08/2013

Batch R175654 **SampType:** DUP Units RPD Limit **10**
SampID: 13040249-002B

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.97**				7.960	0.13	04/08/2013

Batch R175654 **SampType:** DUP Units RPD Limit **10**
SampID: 13040249-003B

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**7.96**				7.960	0.00	04/08/2013

Batch R175654 **SampType:** DUP Units RPD Limit **10**
SampID: 13040249-004B

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lab pH	1.00		**8.06**				8.080	0.25	04/08/2013

STANDARD METHODS 2540 D

Batch R175517 **SampType:** MBLK Units **mg/L**
SampID: MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**< 6**						04/04/2013

Batch R175517 **SampType:** LCS Units **mg/L**
SampID: LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Suspended Solids	6		**105**	100	0	105.0	85	115	04/04/2013
Total Suspended Solids	6		**103**	100	0	103.0	85	115	04/04/2013
Total Suspended Solids	6		**94**	100	0	94.0	85	115	04/04/2013
Total Suspended Solids	6		**93**	100	0	93.0	85	115	04/04/2013

Batch R175517 **SampType:** DUP Units **mg/L** RPD Limit **15**
SampID: 13040249-003A-DUP

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Suspended Solids	6		**< 6**				0	0.00	04/04/2013

Client: Barr Engineering Company **Work Order:** 13040249

Client Project: Leadwood Mine Tailings Site NPDES **Report Date:** 15-Apr-13

STANDARD METHODS 5310 C, ORGANIC CARBON

Batch R175536 **SampType:** MBLK Units **mg/L**
SampID: ICB/MBLK

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**< 1.0**						04/04/2013

Batch R175536 **SampType:** LCS Units **mg/L**
SampID: ICV/LCS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	10.0		**64.5**	59.7	0	108.0	90	110	04/04/2013

Batch R175536 **SampType:** MS Units **mg/L**
SampID: 13040249-005EMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Total Organic Carbon (TOC)	1.0		**6.2**	5.0	1.430	96.4	85	115	04/04/2013

Batch R175536 **SampType:** MSD Units **mg/L** RPD Limit **10**
SampID: 13040249-005EMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Total Organic Carbon (TOC)	1.0		**6.5**	5.0	1.430	100.6	6.250	3.30	04/04/2013

EPA 600 4.1.1, 200.7R4.4, METALS BY ICP (DISSOLVED)

Batch 87071 **SampType:** MBLK Units **µg/L**
SampID: MBLK-87071

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	04/05/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	04/05/2013

Batch 87071 **SampType:** LCS Units **µg/L**
SampID: LCS-87071

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**45.5**	50.0	0	91.0	85	115	04/05/2013
Zinc	10.0		**445**	500	0	89.1	85	115	04/05/2013

Batch 87071 **SampType:** MS Units **µg/L**
SampID: 13040249-001DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**47.2**	50.0	2.6	89.2	75	125	04/05/2013
Zinc	10.0		**2620**	500	2206	82.8	75	125	04/05/2013

Batch 87071 **SampType:** MSD Units **µg/L** RPD Limit **20**
SampID: 13040249-001DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**47.1**	50.0	2.6	89.0	47.2	0.21	04/05/2013
Zinc	10.0		**2600**	500	2206	79.2	2620	0.69	04/05/2013

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

EPA 600 4.1.4, 200.7R4.4, METALS BY ICP (TOTAL)

Batch 87095 **SampType:** MBLK Units µg/L
SampID: MBLK-87095

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**< 2.00**	2.00	0	0	-100	100	04/05/2013
Calcium	50.0		**< 50.0**	50.0	0	0	-100	100	04/05/2013
Magnesium	10.0		**< 10.0**	10.0	0	0	-100	100	04/05/2013
Zinc	10.0		**< 10.0**	10.0	0	0	-100	100	04/05/2013

Batch 87095 **SampType:** LCS Units µg/L
SampID: LCS-87095

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**48.9**	50.0	0	97.8	85	115	04/05/2013
Calcium	50.0		**1280**	1200	0	106.7	85	115	04/05/2013
Magnesium	10.0		**762**	750	0	101.6	85	115	04/05/2013
Zinc	10.0		**469**	500	0	93.8	85	115	04/05/2013

Batch 87095 **SampType:** MS Units µg/L
SampID: 13040249-001CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Cadmium	2.00		**51.7**	50.0	2.9	97.6	75	125	04/05/2013
Calcium	50.0	S	**114000**	1200	111800	200.0	75	125	04/05/2013
Magnesium	10.0	S	**38000**	750	36540	190.7	75	125	04/05/2013
Zinc	10.0		**3260**	500	2677	116.2	75	125	04/05/2013

Batch 87095 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13040249-001CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Cadmium	2.00		**51.9**	50.0	2.9	98.0	51.7	0.39	04/05/2013
Calcium	50.0	S	**113000**	1200	111800	66.7	114200	1.41	04/05/2013
Magnesium	10.0		**37400**	750	36540	117.3	37970	1.46	04/05/2013
Zinc	10.0		**3210**	500	2677	107.2	3258	1.39	04/05/2013

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 87148 **SampType:** MBLK Units µg/L
SampID: MBLK-87148

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	04/10/2013

Batch 87148 **SampType:** LCS Units µg/L
SampID: LCS-87148

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**14.7**	15.0	0	98.1	85	115	04/10/2013

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

STANDARD METHODS 3030 E, 3113 B, METALS BY GFAA

Batch 87148 **SampType:** MS Units µg/L
SampID: 13040249-002CMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**22.1**	15.0	10.0792	80.3	70	130	04/10/2013

Batch 87148 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13040249-002CMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**25.0**	15.0	10.0792	99.6	22.1308	12.23	04/10/2013

STANDARD METHODS 3030 B, 3113 B, METALS BY GFAA (DISSOLVED)

Batch 87235 **SampType:** MBLK Units µg/L
SampID: MBLK-87235

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**< 2.00**	2.00	0	0	-100	100	04/10/2013

Batch 87235 **SampType:** LCS Units µg/L
SampID: LCS-87235

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**15.6**	15.0	0	103.7	85	115	04/10/2013

Batch 87235 **SampType:** MS Units µg/L
SampID: 13040249-002DMS

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	Low Limit	High Limit	Date Analyzed
Lead	2.00		**21.8**	15.0	7.3567	96.3	70	130	04/10/2013

Batch 87235 **SampType:** MSD Units µg/L RPD Limit **20**
SampID: 13040249-002DMSD

Analyses	RL	Qual	Result	Spike	SPK Ref Val	%REC	RPD Ref Val	%RPD	Date Analyzed
Lead	2.00		**22.0**	15.0	7.3567	97.7	21.8069	0.93	04/10/2013

Receiving Check List

http://www.teklabinc.com/

Client: Barr Engineering Company
Work Order: 13040249
Client Project: Leadwood Mine Tailings Site NPDES
Report Date: 15-Apr-13

Carrier: Tim Mathis
Received By: EEP

Completed by: Emily E. Pohlman
On: 04-Apr-13

Reviewed by: Michael L. Austin
On: 04-Apr-13

Pages to follow: Chain of custody [1] Extra pages included [0]

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐	Temp °C	1.8	
Type of thermal preservation?	None ☐	Ice ☑	Blue Ice ☐	Dry Ice	☐	
Chain of custody present?	Yes ☑	No ☐				
Chain of custody signed when relinquished and received?	Yes ☑	No ☐				
Chain of custody agrees with sample labels?	Yes ☑	No ☐				
Samples in proper container/bottle?	Yes ☑	No ☐				
Sample containers intact?	Yes ☑	No ☐				
Sufficient sample volume for indicated test?	Yes ☑	No ☐				
All samples received within holding time?	Yes ☑	No ☐				
Reported field parameters measured:	Field ☐	Lab ☑	NA ☐			
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐				

When thermal preservation is required, samples are compliant with a temperature between 0.1°C - 6.0°C, or when samples are received on ice the same day as collected.

Water – at least one vial per sample has zero headspace?	Yes ☐	No ☐	No VOA vials	☑
Water - TOX containers have zero headspace?	Yes ☐	No ☐	No TOX containers	☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐		
NPDES/CWA TCN interferences checked/treated in the field?	Yes ☐	No ☐	NA	☑

Any No responses must be detailed below or on the COC.

Custody seal(s) intact on shipping container/cooler. TM 4/4/13.

13040249

Chain of Custody

BARR
1001 Diamond Ridge, Suite 1100
Jefferson City, MO 65109
(573) 638-5000

Teklab, Inc.
Courier Pick Up

Project Number: 25860013.00 TLM2 021

Project Name: Leadwood Mine Tailing Site NPDES

Sample Origination State: MO (use two letter postal state abbreviation)

COC Number: LWP 040313

Location	Start Depth	Stop Depth	Depth Unit (m./ft. or in.)	Collection Date (mm/dd/yyyy)	Collection Time (hh:mm)	Matrix: Water	Matrix: Soil	Matrix:	Type: Grab	Type: Comp	Type: QC	Parameters: Water: pH	Total Suspended Solids	Sulfate	Settleable Solids	Total Organic Carbon	Total Metals	Dissolved Metals	Hardness			Parameters: Soil: VOCs (tared MeOH) #1	GRO, BTE (tared MeOH) #1	DRO (tared unpreserved)	Metals (unpreserved)	SVOCs (unpreserved) #2	% Solids (plastic vial, unpres.)			Total Number of Containers	
1. LW-001 (13040249-001)				04/03/13	07:45	X			X			X	X	X	X	X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
2. LW-002 (-002)				04/03/13	08:45	X			X			X	X	X	X	X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
3. LW-US (-003)				04/03/13	07:15	X			X			X	X	X		X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
4. LW-DS (-004)				04/03/13	09:25	X			X			X	X	X		X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
5.LW-DUP (-005)				04/03/13	--:--	X			X			X	X	X		X	X	X	X										5	Preservatives: 2 HNO3, 1 H2SO4, 2 Unpreserved
6.																														
7.																														
8.																														

COC 1 of 1

Project Manager: Ty Morris

Project QC Contact: Andrea Nord

Sampled By: Stephen Moilanen

Laboratory: Teklab

Comments: Invoice to Mark Nations at Doe Run. Results to be sent to Allison Olds (aolds@barr.com) at Barr Engineering, Andrea Nord (anord@barr.com) at Barr Engineering, and Mark Nations (mnations@doerun.com) at Doe Run.
Matrix is surface water.
Metals include Cadmium, Lead, and Zinc.

Common Parameter/Container – Preservation Key

#1 – Volatile Organics = BTEX, GRO, TPH, 8260 Full List

#2 – Semivolatile Organics = PAHs, PCP, Dioxins, 8270 Full List, Herbicide/Pesticide, PCBs

#3 – General = pH, Chloride, Fluoride, Alkalinity, TSS, TDS, TS, Sulfate

#4 – Nutrients = COD, TOC, Phenols, Ammonia Nitrogen, TKN

Relinquished By: Stephen Moilanen — On Ice? ☒Y ☐N — Date: 4-3-13 — Time: 16:00 — Received by: — Date: 4/4/13 — Time: 0630

Relinquished By: — On Ice? ☒Y ☐N — Date: 4/4/13 — Time: 0800 — Received by: — Date: 4/4/13 — Time: 08:00

Samples Shipped VIA: ☐Air Freight ☐Federal Express ☐Sampler ☒Other: Courier Pickup

Air Bill Number:

1.0 Does V rm 4.4.13

Custody Seal Intact rm 4.4.13

#3

Distribution: White – Original Accompanies Shipment to Lab; Yellow – Field Copy; Pink – Lab Coordinator